SCIENCE NEWS-LETTER

The Weekly Summary of Current Science

A SCIENCE SERVICE PUBLICATION

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MULTIPLE AILERONS

A Possible Hint for Glider Construction

(See page 414)

Vol. XVII No. 481

Laurels For Government Scientists

General Science

Congressional Bill Provides For Two Medals

THE government is preparing to heap long over-due laurels upon genius, hard work, and bravery in the field of science.

A bill shortly to be reported out from the House committee on the Library will allow the President to decorate men and women who, while in the employ of the Federal Government, have "made outstanding contributions to the advancement of scientific knowledge or the application of its truths in a practical way for the welfare of the human race and to citizens who, while in the employ of the Federal Government, have rendered conspicuous service to humanity at the voluntary risk of life or health over and above the ordinary risks of duty."

There will be two medals. For the scientist who has made a specific contribution to the knowledge of the world, there will be the Thomas Jefferson Medal of Honor For Distinguished Work in Science. This medal is named after the President of the United States who was an early patron of science, engaged in some scientific work and sent Lewis and Clarke on their famous explorations.

The Jesse W. Lazear Medal of Honor for Distinguished Self-Sacrifice for Humanity will be the medal which would be awarded to those who risk life and health bravely that the cause of science may be advanced. This medal is named after the doctor who, as a member of the famous Yellow Fever Commission, allowed an infected mosquito to bite him and give him a fatal case of the disease which was conquered through the information that this and similar heroic sacrifices gave to medical science.

Only three medals in each class will be awarded each year by terms of this bill, and the National Academy of Sciences will pass on names recommended to it by heads of departments and independent offices of the Government.

It is conceivable that one person might be awarded both medals. The honored persons receiving these medals would, in addition, receive $1000 each.

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Speed Cooling

SCIENCE has produced flakes of ice which would be ideal for cooling beverages and home ice cream freezers, but they are being applied to large scale industrial processes of chemical engineering.

Flake ice is much more useful than block ice and even crushed ice for many chemical purposes because it melts so fast. Ten pounds of flake ice will melt twelve and a half times as fast as a 10-pound block, Crosby Field told the American Institute of Chemical Engineers at their recent meeting. Thus it will cool a chemical reaction generating heat much faster than other forms of ice.

"The new ice looks very much like broken peanut brittle except for color," Mr. Field said. "A 300-pound standard cake of ice has a surface area of 20.7 square feet whereas 300 pounds of one-eighth inch thick flake ice has 1,000 square feet of surface, an area nearly 50 times as great. But the effective ratio of surface area in use is far greater than that indicated by these figures because the surface of the flakes remains practically unchanged as they melt while the area of a block gets much smaller."

Flake ice is formed on a drum full of brine that rotates in water.

Engineering

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The Answer Is

In This Issue

How are Government *scientists* to be honored? p. 402—How has *ice* been made to *cool* faster? p. 402—What should you do for an *unconscious* person? p. 403—What goes in the *first-aid* kit? p. 404—Why does *halo* around the moon predict *rain?* p. 405—How much *larger* than a *planet* is a very large *star?* p. 405—How can *meningitis* be prevented? p. 408—How do *X-rays* affect white blood *cells?* p. 411—What is the *fundamental* stuff of the *universe?* p. 414.

Fewer Sun Spots

SPOTS on the sun are now becoming fewer and will continue to decrease for several years, until the minimum of the spot cycle is past, members of the Astronomical Society of the Pacific, meeting with the Pacific Division of the American Association for the Advancement of Science, were told. Dr. Seth B. Nicholson and Elizabeth Sternberg, of the Mt. Wilson Observatory, told of their studies of the sun.

Dr. Nicholson stated that the activity of the sun, which varies directly with the number of spots, was less in 1929 than 1928, while it appears that the maximum for the cycle came early in 1927. Judged by the numbers of spots, at this maximum the sun was not as spotted as at the previous ones. The astronomer expresses the spottedness by what is called the Wolf number. The maximum for this cycle was 77.8, said Dr. Nicholson, while for the preceding cycle it was 103.9. The three maxima before that gave values for the Wolf numbers of 63.5, 84.9 and 63.7. However, it was pointed out that since 1926 the numbers of spots have been nearly the same. Thus, while the sun at no one time had as many spots as previously, the total numbers may have been rather high.

Astronomy

Science News-Letter, June 28, 1930

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Making Vacations Safe For Pleasure

Health

What To Do When Accident Mars Your Holiday

By Jane Stafford

DRIVING all day, hurrying to make the next town before nightfall, you fail to see the car coming up the side road until too late. After the crash you find yourself uninjured but the other fellow wasn't so lucky. Motor laws of most states require that you stop and give first aid. Of course you want to help the man, but what should you do first?

Before you can decide that you must find out how badly he is hurt. Is he unconscious? Has he broken any bones? Is he badly cut or bruised? The chief thing to do is to make the man as comfortable as possible and then take him to the nearest doctor, unless you have someone to send for a doctor.

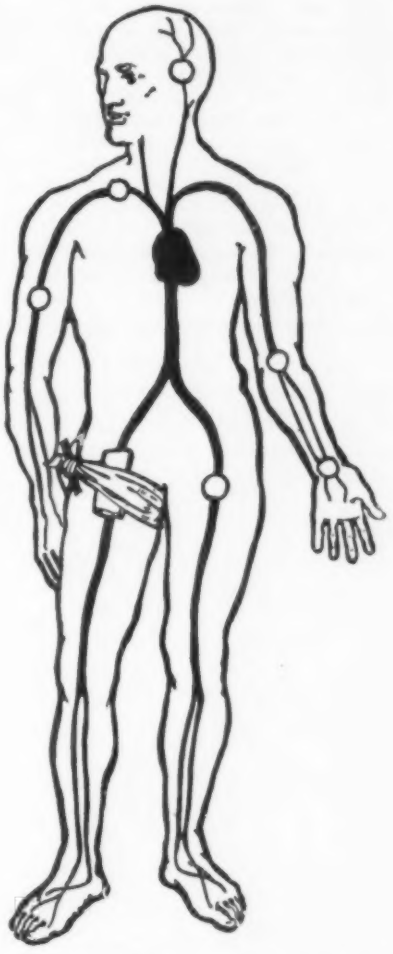
Broken bones should be put in temporary splints, profuse bleeding must be checked, wounds should be protected from further infection. Further treatment should be left to the doctor.

Over 80,000 people are killed in this country each year by traffic accidents, drowning, burns, falls, etc., and over two million more are seriously injured in the same way. Obviously the vacationist and motorist needs to know methods for giving first aid and the correct equipment to have handy for use in such emergencies.

A PERSON who has broken a bone nearly always feels faint and nauseated, is pale and may lose consciousness. The same thing occurs after every injury, including poisoning, apparent drowning, etc. It is known as surgical shock (not to be confused with electrical shock).

The patient should be made to lie down with his head lower than the rest of his body. He should be covered with warm blankets or clothing, and hot water bottles should be put around him under the coverings. Hot bricks or stones may be used if you have no bottles, but be careful that the bottles or bricks are not too hot. An unconscious patient cannot tell you when he is being burned.

If the patient is conscious, give aromatic spirits of ammonia, hot strong tea, or hot black coffee. If he is not conscious, give nothing by mouth but pour a little aromatic spirits of ammonia on a cloth and hold under his nose.



Pressure applied at points indicated by circles will check bleeding from the arteries. A tourniquet, professional or home, should be used.

The arms and legs should be massaged, always rubbing toward the body, and keeping them covered while rubbing.

The most important thing in cases of broken bones is to keep the bones absolutely motionless. In this way further damage is avoided. When a bone breaks and there is no wound or break in flesh or skin, it is called a simple fracture, in contrast to a compound fracture, where the skin is broken and the end of the broken bone is sticking through.

The great danger in compound fractures is from infection. Simple fractures must be handled carefully to prevent them from becoming compound.

In either case the broken bone should be held between splints which are padded and held in place with a bandage. In compound fracture, the wound is covered with a sterile dressing. In putting splints on, the injured part should be held in the most natural position possible without moving too much to get it in that position.

SERIOUS cuts from knife or ax are often the lot of the inexperienced camper. Bobby tries to help his father cut wood for the camp fire but the heavy ax slips and cuts a nasty gash in Bobby's leg. The chief thing for Bobby's father to do is to keep the wound free from dirt, which means to keep everything, including his own hands, out of it.

Only a dry, sterile compress or bandage compress should be put on an open wound. Nothing else should touch it. It is far better to leave the wound uncovered than to put just any bandage or handy piece of rag, even though apparently clean, on it. Only in this way can the danger of blood poisoning, or infection with harmful bacteria, be avoided.

Pieces of wood or glass or clothing that are in the wound may be removed, if this can be done without touching the wound itself, or its edges, with the hands.

In bandaging a wound, the bandage should be handled so that the part of it which is to cover the wound is not touched by the hands or anything else. That part should be laid directly on the wound. Compresses and bandage compresses are usually made so that they may be opened and handled without touching the part meant to cover the wound. A roller bandage should be held by the ends, keeping the center clean and free from germs.

BLEEDING from an ordinary cut will stop as soon as the blood clots, but if a vein or artery has been cut, the blood will continue to flow so that clotting is impossible. Blood from an artery is bright red and spurts out, that from a vein is dark and flows evenly. Either type of bleeding must be checked at once to prevent serious, possibly fatal harm to the injured person from loss of blood.

Pressure over (*Turn to next page*)

the vein or artery will stop the bleeding. When the bleeding is from an artery, pressure should be applied between the heart and the wound. When bleeding is from a vein, pressure should be on the other side of the wound from the heart.

A tourniquet is commonly used to apply pressure, but one may easily be made from materials at hand, such as tie, belt, handkerchief or suspenders. Wire, rope and cord should not be used. Wrap the bandage or strap over a pad at the point where pressure is to be applied, slip a stick of wood or even a lead pencil inside it and twist to tighten, until the flow of blood stops. A tourniquet should be loosened after twenty minutes. If bleeding starts again, the tourniquet should be tightened again.

Bleeding will increase if the heart action is speeded up, so the patient should be kept quiet, lying down, and no stimulants should be given.

THE perils of a vacation spent at the shore may be greatly lessened if the method of applying artificial respiration is learned before starting on the holiday. This first aid procedure is used after apparent drowning and also after electric shock or gas poisoning. It is likewise important to the motoring family, any member of which may be exposed to the hazard of carbon monoxide gas from the automobile exhaust.

The patient should be turned on his belly, one arm extending straight, the other bent at elbow with head resting on it, face turned to one side so mouth and nose are free to breath. The operator kneels, straddling the patient's thighs. The palms of the hands are placed on the small of the patient's back, little fingers just touching lowest ribs, arms held straight.

In this position, the operator swings slowly forward gradually bearing his weight on the patient, till operator's shoulder is above the heel of his hand. This should take about two seconds, and then immediately he should swing backwards, removing the pressure completely.

After two seconds the forward swing is started again. This should be repeated twelve to fifteen times a minute without interruption, for hours, if necessary, until the patient starts breathing or a doctor pronounces him dead. If the patient's natural breathing starts and after a short time stops again, artificial respiration must be started over again.

Artificial respiration should be started at once, without moving the patient from the spot where he is lying, except in cases of gas poisoning. While it is being carried out, an assistant should loosen tight clothing about the neck, waist or chest, and should keep the patient warm.

After he is restored he should be kept quiet and if he must be moved, it should be done while he is lying down.

IN treating burns, the two chief things to do are to keep out air and to keep the burn clean, as one would an open wound. Extreme sunburn should be treated like any other burn. Shock as well as pain may follow burns from the sun or other sources. Clothing should be gently removed and then a sterile gauze dressing, or a sterile picric acid dressing, should be put on the burn and held in place with a loose bandage. Keep patient quiet and treat for shock if necessary.

Bicarbonate of soda, or permanganate of potash, moistened with water, may be applied to insect bites. A solution of table salt or alcohol or cold water can also be used. Scratching mosquito bites should be discouraged, as there is danger of infection.

SICKNESS as well as injuries may occur on vacations. Food cooked over a camp fire is tasty but sometimes underdone. Strange combinations are often eaten by the vacationist. The active, outdoor life is a great aid to digestion, but even so the stomach may be overtaxed, and a digestive upset will ruin the most perfect vacation.

Bicarbonate of soda, ordinary baking soda, is first aid to the upset stomach, besides being valuable for treating insect bites and burns. For indigestion, a teaspoonful in a glass of water. For bites or burns, moisten and apply directly to the injured part.

POISONING, except from spoiled food, is not particularly a vacation hazard, but may occur even at home. When a person swallows poison, the thing to do is to send for a doctor and to give the patient something to make him vomit, so as to get the poison out of his stomach. But if the lips or tongue or throat are burned by a strong acid or caustic alkali, it is not safe to induce vomiting.

AFTER you have given first aid to an injured person, you must get him to his home or a hospital with as little further pain and injury as possible.

If he is able to walk, he should put his arm about your neck and shoulders, and you can further support him with your arm around his waist.

If the person is so badly injured that he cannot or should not walk, the stretcher is the best method of transporting him. (*Turn to page* 413)

What to Put in First-Aid Kit

Two gauze bandages 2½ inches wide.
Two cotton bandages 3 inches wide.
One roll adhesive plaster 1 inch wide.
One dozen safety pins.
One ounce absorbent cotton.
One yard of plain sterile gauze.
One ounce tincture of iodine.
Two ounces bicarbonate of soda.
One drachm permanganate of potash (for snake and insect bites).
One dozen compound cathartic pills (for adults only. Dose: 1 to 3 pills).
Four ounces castor oil (for children).
One clinical thermometer.
One hot water bag.
Aromatic spirits of ammonia (use ½ to 1 teaspoonful in glass of water as stimulant).

This is the way the U. S. Bureau of Mines trains workmen to practice the prone pressure method of artificial respiration on each other.

X-Rays Show Structure of Atoms

Physics

Haloes Produced by X-Rays Tell Size of Molecules

X-RAYS have for years revealed to the eye the arrangement of the bones in our bodies, and they now show how the electrons are placed in the atoms of which all matter is made. For many years physicists have been able to study the arrangement of the atoms in larger aggregations by the use of X-rays, but further studies in the last few years have revealed new facts about the structure of the atoms themselves, Prof. Arthur H. Compton, of the University of Chicago, told the American Physical Society at its Ithaca meeting.

"Several weeks ago I noticed a beautiful halo around the moon," he said. "Half an hour later the halo was visibly smaller in diameter, and it was no surprise when a few hours later rain began to fall.

"The interpretation of such haloes, as due to the diffraction of the moonlight by droplets of water suspended in the air, is well known. The larger the droplet the smaller the angle of diffraction necessary for the appropriate phase difference between the rays coming from the two sides of the drop. So by observing the diameter of the halo, we can estimate the size of the water drops which cause it. A shrinking halo means a growing drop, and hence probable rain.

"In a very similar manner it is possible to find the size of molecules and atoms in a gas, by observing the diffraction haloes produced when they are traversed by a beam of X-rays. For many years it has been possible by this method to make rough estimates of the sizes of the atoms; but only very recently has the theory of the process become well understood, and the experimental technique become sufficiently developed to give us precise information regarding the electron distributions in atoms.

"When we review the many atomic theories that have been proposed and discarded, it may perhaps appear too bold to say that the particular theory now in vogue has any finality. One by one the vortex ring atom of Kelvin, the positively charged jelly of Thomson, the minute solar systems of Rutherford, Bohr and Sommerfeld, as well as the tiny atoms of Crehore, the ring electron atoms of Parson, and the cubic atom of Lewis and Langmuir have given way to more promising successors. We replace even Schrödinger's diffuse cloud of negative electricity by a probability cloud of electrons after the manner of Heisenberg. It now appears, however, that the only one of these many proposals which can account for the observed X-ray diffraction haloes is that of Heisenberg."

The mass of each item in this list, prepared by Prof. Stewart, is about a million times smaller than the one preceding it:

The known material universe
A large spiral nebula
A very large star
A good-sized planet
An ocean
A mountain peak
A forest
MAN
A butterfly
A paramecium
A bacterium
The largest organic molecules
A few score electrons
A quantum of ultraviolet light.

After giving details of the methods used in interpreting these X-ray experiments, he concluded:

"We may say with some confidence that the aspect of the problem of atomic structure which is concerned with the distribution of the electrons in atoms is finding a satisfactory solution. It is a relief to note that a theory is at hand which affords a reasonable interpretation of the electron distributions which the experiments show.

"In a bulletin of the National Research Council, published in 1922, having experiments of this character in mind, I had the temerity to predict that within ten years the electron positions in the lighter atoms would probably be known as reliably as were the positions of the atoms in certain crystals. I believe that prediction is now verified. For this information regarding electron positions in atoms is based upon precisely the same principles as is for example our information regarding the position of the oxygen atoms in a calcite crystal.

"I suppose it would be fair to say that experiments such as these come the closest of any yet performed to showing us 'what the atom looks like.' For after all is not seeing an object a diffraction phenomenon similar to those under discussion? And when we thus 'look' at the atom we find it composed of electrons diffusely distributed."

THE hugest thing under study by science is about as much larger than man himself as his body is larger than the smallest known thing. To the American Physical Society Prof. John Q. Stewart of Princeton detailed the range of masses in the material universe.

"The total range of mass represented is something like a trillion decillion decillion, with man about in the middle," Prof. Stewart said. "The physicists deal with the lower, the astronomers with the upper reaches. These two sciences have vastly extended our knowledge of the material universe, and doubtless will continue to push outward its boundaries (although there are mathematical physicists who believe that something like a maximum limit to the size of space will present itself). Literary men and artists being familiar with only a small range of the whole, the general public is without an adequate guide book to the universe. In the regions north of oceans and south of butterflies only the scientific men know their way around."

A suggestion as to the way in which the atoms of stars may be made to release their constitutional energy was given by Prof. Stewart. His theory is that the enormous accelerations of the atoms, set in motion by the great heat, may help in releasing this energy. Millions of times a second a molecule probably collides with another, but between collisions it is probably traveling with a uniform speed. But Dr. Stewart held forth no hope of man's being able to apply any such methods to solve his own power problems.

"The hypothetical process here outlined presents a magnificently inefficient mode of releasing power," he said. "In order to generate only one kilowatt, a mass equal to the earth's would require continuously to be subjected to an acceleration of about 3500 million times that of gravity."

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Fossils in the State of Virginia — A Classic of Science

Paleontology

NOTES ON THE STATE OF VIRGINIA; written in the year 1781, somewhat corrected and enlarged in the winter of 1782, for the use of a Foreigner of distinction, in answer to certain queries proposed by him respecting . . . [*table of contents follows. By Thomas Jefferson. Paris?*] *MDCCLXXXII* (1782)

NEAR the eastern foot of the North mountain are immense bodies of *Schist*, containing impressions of shells of very different kinds from the first sources of the Kentucky, which bear no resemblance to any I have ever seen on the tide-waters. It is said that shells are found in the Andes, in South-America, fifteen thousand feet above the level of the ocean. This is considered by many, both of the learned and unlearned, as a proof of an universal deluge. To the many considerations opposing this opinion, the following may be added. The atmosphere, and all its contents, whether of water, air, or other matters, gravitate to the earth; that is to say, they have weight. Experience tells us, that the weight of all these together never exceeds that of a column of mercury of 31 inches in height, which is equal to one of rain water of 35 feet high. If the whole contents of the atmosphere then were water, instead of what they are, it would cover the globe but 35 feet deep; but as these waters, as they fell, would run into the seas, the superficial measure of which is to that of the dry parts of the globe, as two to one, the seas would be raised only 52½ feet above their present level, and of course would overflow the lands to that height only. In Virginia this would be a very small proportion even of the champaign country, the banks of our tide-waters being frequently, if if not generally of a greater height. Deluges beyond this extent then, as for instance, to the North mountain or to Kentucky, seem out of the laws of nature. But within it they may have taken place to a greater or less degree, in proportion to the combination of natural causes which may be supposed to have produced them. History renders probable some instances of a partial deluge in the country lying round the Mediterranean sea. It has been often supposed, and is not unlikely, that that sea was once a lake. While such, let us admit an extraordinary collection of the waters of the atmosphere from the other parts of the globe to have been discharged over that and the countries whose waters run into it. Or without supposing it a lake, admit such an extraordinary collection of the waters of the atmosphere, and an influx of waters from the Atlantic ocean, forced by long continued western winds. The lake, or that sea, may thus have been so raised as to overflow the low lands adjacent to it, as those of Egypt and Armenia, which, according to a tradition of the Egyptians and Hebrews, were overflowed about 2300 years before the Christian era; those of Attica, said to have been overflowed in the time of Ogyges, about five hundred years later; and those of Thessala, in the time of Deucalian, still 300 years posterior. But such deluges as these will not account for the shells found in the higher lands. A second opinion has been entertained, which is, that in times anterior to the records either of history or tradition, the bed of the ocean, the principal residence of the shelled tribe, has, by some great convulsion of nature been heaved to the heights at which we now find shells and other remains of marine animals. The favorers of this opinion do well to suppose the great events on which it rests to have taken place beyond all the eras of history; for within these, certainly none such are to be found; and we may venture to say further, that no fact has taken place, either in our own days, or in the thousands of years recorded in history, which proves the existence of any natural agents, within or without the bowels of the earth, or force sufficient to heave, to the height of 15,000 feet, such masses as the Andes. The difference between the power necessary to produce such an effect, and that which shuffled together the different parts of Calabria in our days, is so immense, that, from the existence of the latter we are not authorized to infer that of the former.

M. de Voltaire has suggested a third solution of this difficulty (Quest. Encycl. Coquilles). He cites an instance in Touraine, where, in the space of 80 years, a particular spot of earth had been twice metamorphosed into soft stone, which had become hard when employed in building. In this stone shells of various kinds were produced, discoverable at first only with the microscope, but afterwards growing with the stone. From this fact, I suppose, he would have us infer, that, besides the usual process for generating shells by the elaboration of earth and water in animal vessels, nature may have provided an equivalent operation, by passing the same materials through the pores of calcareous earths and stones: as we see calcareous dropstones generating every day by the percolation of water through limestone, and new marble forming in the quarries from which the old has been taken out; and it might be asked, whether it is more difficult for nature to shoot the calcareous juice into the form of a shell, than other juices into the forms of crystals, plants, animals, according to the construction of the vessels through which they pass? There is a wonder somewhere. Is it greatest on this branch of dilemma; on that which supposes the existence of a power, of which we have no evidence in any other case; or on the first, which requires us to believe the creation of a body of water and its subsequent annihilation? The establishment of the instance, cited by M. de Voltaire, of the growth of shells unattached to animal bodies, would have been that of his theory. But he has not established it. He has not even left it on ground so respectable as to have rendered it an object of enquiry to the literati of his own country. Abandoning this fact, therefore, the three hypotheses are equally unsatisfactory; and we must be contented to acknowledge, that this great phenomenon is as yet unsolved. Ignorance is preferable to error; and he is less remote from the truth who believes nothing, than he who believes what is wrong. . . .

OUR quadrupeds have been mostly described by Linnæus and Mons. de Buffon. Of these the Mammoth, or big buffalo, as called by the Indians, must certainly have been the largest. Their tradition is, that he was carniverous, and still exists in the northern parts of America. A delegation of warriors from the Delaware tribe having visited the governor of Virginia, during the revolution, on matters of business, after these had been discussed and settled in council, the governor asked them some questions relative to their country, and among others, what they knew or had heard of the animal whose bones were found at the Saltlicks on the Ohio. Their chief speaker immediately put himself into an attitude of oratory, and with a pomp suited to what he conceived the elevation of his subject, informed him that it was a tradition handed down from their fathers, "That in ancient times a herd of these tremendous animals came to the big-bone licks, and began an universal destruction of the bear, deer, elks, buffaloes, and other animals which had been created for the use of the Indians: that the Great Man above, looking down and seeing this, was so enraged, that he seized his lightning, descended on the earth, seated himself on a neighboring mountain, on a rock of which his seat and the print of his feet are still to be seen, and hurled his bolts among them till the whole were slaughtered, except the big bull, who presenting his forehead to the shafts, shook them off as they fell; but missing one at length, it wounded him in the side; whereon, springing round, he bounded over the Ohio, over the Wabash, the Illinois, and finally over the great lakes, where he is living at this day." It is well known that on the Ohio, and in many parts of America further north, tusks, grinders, and skeletons of unparalled magnitude, are found in great numbers, some lying on the surface of the earth, and some a little below it. A Mr. Stanley, taken prisoner by the Indians near the mouth of the Tanisee, relates, that, after being transferred through several tribes, from one to another, he was at length carried over the mountains west of the Missouri to a river which runs westwardly: that these bones abounded there; and that the natives described to him the animal to which they belonged as still existing in the northern parts of their country; from which description he judged it to be an elephant. Bones of the same kind have been lately found, some feet below the surface of the earth, in salines opened on the North Holston, a branch of the Tanisee, about the latitude of 36½° north. From the accounts published in Europe, I suppose it to be decided, that these are of the same kind with those found in Siberia. Instances are mentioned of like animal remains found in the more southern climates of both hemispheres; but they are either so loosely mentioned as to leave a doubt of the fact, so inaccurately described as not to authorize the classing them with the great northern bones, or so rare as to found a suspicion that they have been carried thither as curiosities from more northern regions. So

Thomas Jefferson at the age of 25

that on the whole there seem to be no certain vestiges of the existence of this animal further south than the salines last mentioned. It is remarkable that the tusks and skeletons have been ascribed by the naturalists of Europe to the elephant, while the grinders have been given to the hippopotamus, or river horse. Yet it is acknowledged, that the tusks and skeletons are much larger than those of the elephant, and the grinders many times greater than those of the hippopotamus, and essentially different in form.—Wherever these grinders are found, there also we find the tusks and skeleton; but no skeleton of the hippopotamus nor grinders of the elephant. It will not be said that the hippopotamus and the elephant came always to the same spot, the former to deposit his grinders, and the latter his tusks and skeleton. For what became of the parts not deposited there? We must agree then that these remains belong to each other, that they are of one and the same animal, that this was not a hippopotamus, because the grinders differ in their size as well as in the number and form of their points. That it was not an elephant, I think ascertained by proofs equally decisive. I will not avail myself of the authority of the celebrated[1] anatomist, who, from an examination of the form and structure of the tusks, has declared they were essentially different from those of the elephant: because another[2] anatomist, equally celebrated, has declared, on a like examination, that they are precisely the same. Between two such authorities I will suppose this circumstance equivocal. But, 1. The skeleton of the mammoth (for so the incognitum has been called) bespeaks an animal five or six times the cubit volume of the elephant, as Mons. de Buffon has admitted. 2. The grinders are five times as large, are square, and the grinding surface studded with four or five rows of blunt points: whereas those of the elephant are broad and thin, and their granding surface flat. 3. I have never heard an instance, and suppose there has been none, of the grinder of an elephant being found in America. 4. From the known temperature and constitution of the elephant, he could never have existed in those regions where the remains of the mammoth have been found.—The elephant is a native only of the torrid zone and its vicinities: if, with the assistance of warm apartments and warm clothing, he has been preserved in life in the temperate climates of Europe, it has only been for a small portion of what would have been his natural period, and no instance of his multiplication in them has ever been known. But no bones of the mammoth, as I have before observed, have been ever found further south than the salines of the Holston, and they have been found as far north as the Arctic circle. Those, therefore, who are of opinion that the elephant and mammoth are the same, must believe, 1. That the elephant known to us can exist and multiply in the frozen zone; or, 2. That an eternal fire may once have warmed those regions and since abandoned them, of which, however, the globe exhibits no unequivocal indications; or, 3. That the obliquity of the ecliptic, when these elephants lived, was so great as to include within the

(*Turn to page* 413)

[1]Hunter. [2]D'Aubenton.

More Meningitis

A PROGRESSIVE increase in the number of cases of meningococcus meningitis has taken place in this country during the last five years, Dr. R. C. Williams of the U. S. Public Health Service told the joint meeting of the Annual Conference of State and Territorial Health Officers with the U. S. Public Health Service and the Annual Conference of State and Provincial Health Authorities of North America.

"It is true that the actual number of cases is not large when compared with the total population," Dr. Williams said. "It is significant, however, that each year there has been an increase over the preceding year and that this rise has continued for five years."

No comparable increase has been reported from Europe. The total number of cases reported throughout the United States for the past five years is as follows: 1925, 1,859 cases; 1926, 2,226 cases; 1927, 3,204 cases; 1928, 5,781 cases; 1929, 9,660 cases. During the first 22 weeks of 1930, forty-seven states reported 5,400 cases.

The control of this disease is extremely difficult. Studies conducted in various parts of the country have failed to produce any new methods of importance. The most important preventive and control methods now known are: Prompt recognition of cases of the disease; prompt reporting to the health authorities; avoidance of overcrowding; maintenance of high standards of bodily vigor; sterilization of dishes and eating utensils; optimum of fresh air and sunshine for carriers and convalescents.

Medicine

Science News-Letter, June 28, 1930

Scythians in Siberia

THE Scythians, whose wild troops of horsemen hung like a cloud on the northern edges of the maps of antiquity, in what is now southern Russia, once had their home far to the eastward, in the Altai region of Siberia. There these nomads maintained a relatively high culture, knowing the arts of massive log building, decorative wood carving and the working of metals.

Light on this ancient civilization, which flourished in interior Asia from the sixth to the fourth centuries B. C., has been shed by a recent exploration by Prof. S. I. Rudenko of Leningrad. His chief find was an ancient tomb, built of heavy logs, in which an old-time chieftain had been buried. It was a double structure, one room constituting the tomb proper and the other a large burial chamber for the chief's horses, which had apparently been slain to carry their master into the next world.

The front chamber had been looted. It still contained the empty coffin, part of a carpet which had covered the walls, and a number of household objects. The thieves, whoever they were, had then attempted to cut through the wall to the second chamber, but had broken their tool and left the pieces lying there. Thus the horse-burial was left untouched.

There were in all ten carcasses of horses, preserved in the permanently frozen soil. Their bridles and saddles, prototypes of present-day models, are of remarkably artistic workmanship. They are trimmed with numerous carved wooden figures covered with gold, representing human beings, carnivorous animals, deer, rams and birds. Two of the horses were equipped with head masks representing antlered deer, made of skin and felt, covered with gold and richly ornamented.

Prof. Rudenko believes, on the basis of the saddle types and of the method of burial, that the replacement of the northern reindeer by the horse as the beast of burden of this people was of comparatively recent date.

The carcasses of the horses will be brought to Leningrad frozen for study by geneticists and zoologists.

Oceanography

Science News-Letter, June 28, 1930

Rare Stork

THE U. S. Zoological Park at Washington has just added to its collection of rare birds one of the rarest species in captivity, the saddle-billed stork of equatorial Africa. This is a handsome bird with black and white plumage, not quite as large as the common European stork. He gets his name from a peculiar patch of white leathery skin, shaped like an English saddle, at the upper end of his beak.

Ornithology

Science News-Letter, June 28, 1930

Cancer Diagnosis

PHYSICIANS can diagnose cancer better than they could 15 years ago. Such is the result of a test held as part of the three-day conference of pathologists at the surgical pathological laboratories and the Garvan experimental laboratory of the Johns Hopkins Hospital and University under the direction of Dr. Joseph Colt Bloodgood.

The physicians did not agree on a single borderline case in their diagnoses of the sections of tumors. Neither did the physicians who examined similar and in some cases the same sections 15 years ago. This shows the great need for a stain which will differentiate the cancer cell from other cells, so that it will not be possible to miss it in examining sections from suspected tumors.

The majority of the pathologists in 1930 apparently made the correct diagnosis while the majority in 1915 did not. This shows the improvement in physicians' ability to diagnose this disease from microscopic sections. At this conference all the doctors agreed on every definite case of cancer, and all agreed on every definite benign tumor. The disagreement was entirely on the borderline cases. This means great security to the patient facing an operation for possible cancer. If he really has cancer and there is a good pathologist in the operating room to make a rapid examination of a section of the tumor, the patient will not get incomplete treatment for his cancer.

Occasionally the tumor may be diagnosed cancer when it is not cancer, and the patient will get the operation for cancer when he did not need it. This is the safest mistake that can be made, and need not be feared. The dangerous thing is the incomplete operation when cancer really is present. Even the safe mistake, the operation for cancer when cancer is not present, can be prevented if a differential stain for cancer can be developed.

Medicine

Science News-Letter, June 28, 1930

Ocean Pastures

JUST as the bulk of pasturage in a meadow on land is usually supplied by a relatively small number of plant species growing in great abundance, so also the microscopic plants that form the "oceanic pasture" and supply the basic food for fish exist in countless billions of individuals but in only a few species.

Reporting on ten years of research on diatoms and dinoflagellates at the Scripps Institution of Oceanography in La Jolla, Calif., W. E. Allen states that less than twenty species of dia-

IN VARIOUS[E]

SCIENCE FIELDS

toms, included in five genera, have been prominent in the catches he has examined, although the total number of species involved is considerably more than a hundred.

There is an analogy also between the times of abundance and scarcity in land and ocean pastures. Grass and clover will be scanty or totally unavailable during winter and drought periods, and similarly the microscopic plants of the water have their periods of low abundance. Mr. Allen states that these usually occur in May, August and December, but they may come at other times as well.

The minute plant life is not found in greatest abundance at the surface of the water, where there is most sunlight, but at depths of sixty feet or more. Certain species occur only below that level, and others only above.

The offshore distribution of the sea pasturage confirms the long-standing impression that sea life is in the long run dependent on the land, for as yet no large catches of the organisms have been obtained as far as 100 miles from shore.

Oceanography

Science News-Letter, June 28, 1930

Ancient Kings

A NEWLY discovered line of kings who ruled in Syria and had close dealings with Egypt back in the thirteenth century B. C. must be added to the world's ancient history records as a result of excavations by the Institut de France at Minet-el-Beida, in northern Syria.

The expedition, attracted by the belief that an ancient port and trading center must have stood at this site on the eastern shore of the Mediterranean, began digging not far from shore, and discovered many funeral vases and figures of deities, and at last a stone sepulchre. Four skeletons, stripped of their funeral adornments, lay scattered in the tomb. Robbers who knew how to remove a keystone of the vault had plundered the place in ancient times.

Objects rejected by the robbers, however, show that this was a regal burial place. Egyptian jars of alabaster, beads of gold and of stones, glass paste goblets, terra cotta vases painted in the Mycenean or Cyprian style, and an ivory casket decorated with a goddess reminiscent of Cretan deities, all indicate the dignity of the tomb owners.

Prof. F. A. Schaeffer, leader of the archæological mission, concluded that undoubtedly the tombs contain the bodies of an unknown princely dynasty of northern Syria.

Search for the palace and town associated with the cemetery resulted in the discovery of stone foundations of the palace nearby, and a library of terra cotta tablets covered with cuneiform writings. Some of the tablets bear a script heretofore unknown, Prof. Schaeffer reported. As there are only twenty-six characters in this script, it appears that alphabetic writing was known.

Archæology

Science News-Letter, June 28, 1930

Pacific Science Congress

CANADA is planning to welcome the scientists concerned with problems of the area surrounding the Pacific Ocean who will come to Victoria and Vancouver, B. C., in 1932 for the Fifth Pacific Science Congress, the first to be held on the eastern side of the Pacific.

Dr. H. M. Tory, president of the National Research Council of Canada, heads the committee now making plans for the international meeting. Previous congresses have been held in Hawaii, Australia, Japan, and Java. One of the objects that brings the scientists of various countries together is: "To strengthen the bonds of peace among the Pacific peoples by promoting a feeling of brotherhood among the scientists of all the Pacific countries."

General Science

Science News-Letter, June 28, 1930

Slowed by Heat

THE photoelectric cell, "magic lamp" that makes possible talking movies and television, is slowed up by infrared light of wavelength longer than can be seen, Dr. A. R. Olpin, of the Bell Telephone Laboratories, told the American Physical Society.

The active part of the cell is a layer of metallic sodium or potassium. When visible light falls on this layer, electrons are emitted, and give rise to the photoelectric current, which varies in strength with the intensity of illumination. Dr. Olpin explained that when a cell is operating by excitation with visible light, the current may be reduced to half when infrared light falls on the cell.

Physics

Science News-Letter, June 28, 1930

Planet Pluto

DEFINITE proof that Pluto, the planetary object recently discovered by Lowell Observatory astronomers, is really a planet revolving beyond the orbit of Neptune has been obtained by astronomers at the Mt. Wilson Observatory, Pasadena, Calif.

"This orbit indicates definitely that the object belongs to the solar system, and is a small trans-Neptunian planet, rather than a comet," said Dr. Shapley. "The new orbit satisfactorily represents all known observations of the planet."

Because of the slow motion of the planet, all the observations made of it since discovery have not been sufficient to permit an accurate calculation of its orbit. Discovery of several photographic plates taken in 1919 on which the planet was recorded have given the Mt. Wilson astronomers the material for a much more precise determination of the planet's path.

Dr. Seth B. Nicholson and N. U. Mayall calculated the orbit and found that Pluto revolves around the sun once in a year equal to 251.8 of ours. The eccentricity of its orbit is .25, which means that it is an ellipse not very far from circular. A preliminary orbit calculated by the Lowell astronomers indicated that it was an extremely elongated ellipse while still other astronomers believed that it was still longer and that the planet would take many thousands of years to make a circuit of the sun.

An independent calculation of the orbit was made at the Students' Observatory of the University of California, by E. C. Bower and F. L. Whipple, under the direction of Prof. A. O. Leuschner. This orbit agrees closely with the Mt. Wilson computation.

The Berkeley orbit is as follows: Perihelion passage (time of closest approach to sun): Feb. 27, 1989. Period: 249.17 years. Eccentricity: .254. Semimajor axis: 39.60. Perihelion angle: 113° 8′. Node: 109° 22′. Inclination: 17° 9′. Perihelion distance: 29.55 times distance from earth to sun.

This indicates that the planet is approaching the sun and will get brighter until 1989. Then it will be 27,400,000,000 miles from the sun, about the same distance as that of Neptune, until recently the farthest known planet.

Astronomy

Science News-Letter, June 28, 1930

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Heating the floors in school buildings, instead of using ordinary radiators or ventilating ducts, has been suggested in England.

Government poultry experts are trying to remove the gambling element from turkey raising by solving the parasite problem.

Eyestrain May Be Caused by "Nerves"

Medicine

"Ocular Neurosis" Often Results From Fear

EYESTRAIN, so-called, is more apt to be the result of "nerves" than of any disease of the eyes.

Dr. George S. Derby, of Boston, described to the American Medical Association a number of cases he had seen in which the patient recovered from his eyestrain when his bodily condition was treated and when the psychologic cause of his eyestrain was explained and he was persuaded to use his eyes normally. He suggested that the term eyestrain should be banished from our vocabulary.

"If the general public could learn that eyes are seldom strained, this would be a much happier world to live in," he said. "The fact of the matter is that the eye is provided with a large factor of safety and that healthy eyes do not become diseased even by excessive use."

Most of these cases of ocular neurosis, as Dr. Derby called it, are found in sensitive nervous persons. Fear is the commonest factor in these cases. Some ocular pain or discomfort makes the patient afraid that he is injuring his eyes permanently, that he cannot continue his occupation and perhaps will become dependent. Many of Dr. Derby's patients had given up their work and many pleasures, and were devoting themselves to resting their eyes as much as possible.

Dr. Derby asked opthalmologists not to overlook the psychologic factor in causes of eyestrain, and to treat the mental condition of their patients as well as to correct their vision with eyeglasses.

X-Ray for Boils

X-RAYS have been found helpful in the treatment of many diseases for which they are not generally used. Among these conditions are boils, carbuncles, certain cases of pneumonia, erysipelas, inflammation of the kidneys, inflammation of the parotid gland and many other inflammatory conditions, Dr. Arthur U. Desjardins, of Rochester, Minn., told the American Medical Association.

Irradiation tends to destroy the white blood cells or leucocytes, which gather to defend the body against infection. It would seem that a destruction of these defender cells would do more harm than good, but Dr. Desjardins explains that the white cells contain a substance that enables them to destroy the invading germs. Irradiation, by destroying the cells, liberates the protective substance and makes it even more readily available for defensive purposes than when it is in the intact cells.

Sympathetic Disease

ACTUAL organic disease may result from mental disturbance. Dr. Cornelius C. Wholey, of Pittsburgh, described the case of a fourteen-year-old girl who had attacks of what seemed to be gall-bladder disease in imitation of and in sympathy with a real case in her mother. There was no evidence of organic disease but the child's digestive system became so upset that she will probably never be healthy.

Another healthy girl aged 18 grieved so over the death of her mother that she took to her bed six weeks later and remained there until the age of 40 when she died of exhaustion, toxicity and lack of nourishment.

In these and similar cases described by Dr. Wholey, the mental and emotional disturbances upset the normal functions of the sympathetic nervous system which regulates the body's secretion, circulation, digestion and respiration. If the upset persists too long, it is likely to become organic.

Vital Hormone

STUDIES with cortin, the vital hormone, were described by Dr. Frank A. Hartman of the University of Buffalo at the meeting of the Association for the Study of Internal Secretions. This hormone comes from the cortex of the adrenal glands, two small, cap-shaped organs that lie just above the kidneys and are essential to life.

Animals from which both adrenal glands have been removed live a normal existence indefinitely if injected with cortin, Dr. Hartman said. Cats with both adrenals removed live an average of not more than eleven days if untreated. Prominent symptoms in these animals are loss of appetite, loss of weight and a lack of interest in their surroundings.

The treated animals eat as much as or more than normal, gain weight, play and fight. They recover from wounds and resist infections and show all the reactions of healthy animals.

It has been possible to revive animals which were near death after removal of the adrenal glands by injection of the vital hormone. In a little more than an hour after the treatment, one animal sat up and in two hours was eating.

The cortin on which Dr. Hartman reported was prepared so as to be nearly free from epinephrin. This hormone is secreted by the medulla, that part of the adrenal gland which is not the cortex. Epinephrin has a strong restorative action itself, but animals can live without epinephrin or the part of the gland that secretes it, while they cannot live without the cortical part of the gland and its secretion.

Gland and Arteries

THE probable role played by the pituitary gland in the development of arteriosclerosis, more familiarly known as hardening of the arteries, was discussed by Dr. Robert C. Moehlig, of Detroit.

The effect of feeding animals on high fat diets, on normal diets with injections of the posterior lobe of the pituitary gland, and on high fat diets with the pituitary injections were reported. Control animals were fed on normal diets alone and compared with the other groups.

Four of the five animals fed on the high fat diet alone showed gross arteriosclerotic changes of the aorta, the main blood vessel from which the arteries of the body proceed. Those fed on the high fat diet plus the pituitary extract showed the most intense lesions of all. Eight of the ten animals showed marked arteriosclerotic changes and microscopic examinations disclosed changes of the type seen in human hardening of the arteries.

The injection of the pituitary extract alone, without any dietary influence, produced overdevelopment of the cortex of the adrenal glands. Dr. Moehlig called this an important link in the chain of arteriosclerosis.

Medicine

Science News-Letter, June 28, 1930

Somewhere in the English Language

SOMEWHERE—how remote and inaccessible that sounds. Somewhere in that forest maze of our language—seemingly inextricably intermingled—are words which bring treasures of money, power, position, to the skillful user. Words that trill with laughter, thunder commands, tender words fragile as a wood plant, terms of lofty inspiration, compelling words to add strength to your arguments, words for every shade of meaning.

All round you they are, "close by, disregarded, quite at hand," as Conrad once exclaimed—yet by force of circumstance, you travel the one small path that years of usage have worn through this labyrinth.

How often you have sought to leave this path—to find a new word for that trite expression, to clothe your thought in terms that clearly express your meaning—to avoid constant needless repetition. Your dictionary cannot help you here—you must first know the words you are seeking.

How to find those words you have forgotten—or perchance, are not familiar with! And how to recognize them!

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Name _____

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Many Occupations Cause Deafness

Health

IF a group of weavers tried to strike for better pay or shorter hours they would have a hard time holding a meeting, because so many would be unable to hear what their leader was trying to say.

This possible outcome of deafness as a result of a noisy job was brought to the attention of the Federation of Organizations for the Hard of Hearing by Dr. Frank G. Pedley, of the Montreal General Hospital.

A Scottish physician has found that 75 per cent. of boiler makers either could not hear at all at a public meeting, or could hear only with difficulty and Dr. Pedley's own experience with weavers is similar.

"Every one has heard of boiler-maker's deafness, but there are many other occupations in which work is carried on amid a most frightful din, and in which the workers almost invariably lose their hearing," he stated.

Among occupations which are hard on the ears are: Spinning, carding and combing in the textile industry, chipping and stamping metals, stone cutting, tunnel construction, riveting, stoking aboard ship. Some jobs in aviation, testing of firearms, cement manufacture, and wood work were included.

The number of individuals exposed to undue noise runs into hundreds of thousands, Dr. Pedley estimated. Chronic occupational deafness usually creeps on insidiously until some one calls the victim's attention to it. This type of deafness is traced to a degeneration of the delicate receiving apparatus of the internal ear.

DEFECTIVE hearing can be inherited, Dr. Emil Amberg, of Detroit, emphasized in an address on marriage and deafness.

Citing types of inherited deafness, Dr. Amberg spoke of otosclerosis, a disease characterized by the formation of spongy bone in the labyrinth of the ear. Investigations indicate that this condition exists in certain persons who have an inborn tendency to it. Marriage between close relatives is likely to result in deafness among the children, if the parents had a record of deaf-mutism in the family.

Science News-Letter, June 28, 1930

Fossils of Virginia—*Continued*

tropics all those regions in which the bones are found: the tropics being, as before observed, the natural limits of habitation for the elephant. But if it be admitted that this obliquity has really decreased, and we adopt the highest rate of decrease yet pretended, that is of one minute in a century, to transfer the northern tropic to the Arctic circle, would carry the existence of these supposed elephants 250,000 years back; a period far beyond our conception of the duration of animal bones left exposed to the open air, as these are in many instances. Besides, though these regions would then be supposed within the tropics, yet their winters would have been too severe for the sensibility of the elephant. They would have had too but one day and one night in the year, a circumstance to which we have no reason to suppose the nature of the elephant fitted. However, it has been demonstrated, that, if a variation of obliquity in the ecliptic takes place at all, it is vibratory, and never exceeds the limits of 9 degrees, which is not sufficient to bring these bones within the tropics. —One of these hypotheses, or some other equally voluntary and inadmissible to cautious philosophy, must be adopted to support the opinion that these are the bones of the elephant. For my own part, I find it easier to believe that an animal may have existed, resembling the elephant in his tusks, and general anatomy, while his nature was in other respects extremely different.

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Safe Vacations—*Continued*

A stretcher can be improvised from two poles and some coats. The poles are slipped through the sleeves of the coats which have been turned inside out. The flaps are then turned down and buttoned underneath.

In case you are alone with the injured person you can carry him in your arms for a short distance. For a longer distance it is best to use the fireman's lift and carry him on your back.

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NEW BOOKS

SOME APPLICATIONS OF ORGANIC CHEMISTRY TO BIOLOGY AND MEDICINE—George Barger—*McGraw-Hill* —186 p. $2.50. Six lectures given under the George Fisher Baker non-resident lectureship in chemistry at Cornell University by the professor of chemistry in relation to medicine at Edinburgh University. The subjects covered are hormones, vitamins, chemotherapy, chemical constitution and physiological action, and the blue adsorption compounds of iodine. The book is too technical to be read without considerable knowledge of chemistry, but scientists and students of biology, chemistry and medicine will enjoy these lectures by an eminent authority.

Biochemistry

Science News-Letter, June 28, 1930

AN ALBUM OF OUR WILD FLOWERS; AN ALBUM OF OUR TREES—*S. Gabriel Sons and Co.* $2 each. These two books may be used to encourage young beginners in botany to found their own herbaria. Each consists of a number of sheets on which pressed specimens may be mounted, a sheet of gummed strips for holding them down, and several pages of pictures which will aid in identifications, printed in color on gummed paper which may be stuck to the herbarium sheets.

Botany

Science News-Letter, June 28, 1930

THE LONDON NAVAL CONFERENCE: ITS BACKGROUND AND RESULTS—B. H. Williams—*Univ. of Pittsburgh.* 111 p., 75c. A series of twelve radio talks, published in an attractive paper-bound book. With the Battle of the Treaty now looming in the Senate, these essays are timely and will be useful as a review of the naval situation.

Politics

Science News-Letter, June 28, 1930

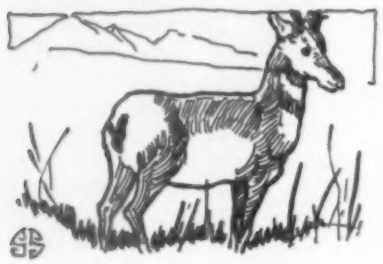
FRUIT MARKETS IN EASTERN ASIA —B. H. Crocheron and W. J. Norton —*Univ. of California Printing Office.* 366 p. "Around the world each useful product flies," wrote Oliver Goldsmith many years ago. The author of "The Deserted Village" would doubtless have been amazed to learn that the appetite for fruit of Malays in the Dutch East Indies helps to keep villages in California and Palestine well populated. This and a thousand other like facts make this economic bulletin most interesting reading.

Economics

Science News-Letter, June 28, 1930

NATURE

By Frank Thone



Pronghorn

ALREADY the tide of spring travel to the National Parks is setting full and strong. The first comers in such places as Rocky Mountain National Park, Yellowstone National Park and its new neighbor Grand Teton National Park, are reaping the reward reserved for early birds, in splendid opportunities for observing animals. For now the herds of game are still in the lowlands, but later, when the big rush of tourists is on, they will be out of sight up the mountains, where they find better pasture and freedom from insects and automobiles.

One of the choicest of all our native animals, which can be seen all along the Lamar river road in the Yellowstone, is the pronghorn. It is sometimes called the American antelope, but although it is as graceful as any old-world antelope it really is not a member of that family. It stands by itself, the one species constituting not only a genus but a family. If it ever had any close relatives they disappeared long ago.

The pronghorn came very near disappearing itself, so far as that goes. When the shameless and senseless butchery of the bison was on during the latter part of the nineteenth century, the pronghorn had to dine out of the same bitter dish, and when we came to our wits again it was even nearer extinction than the buffalo. It is protected now, but even yet it is not certain whether it can stage a strong comeback such as the bison has. There are a few hundred specimens in the Yellowstone, and a considerably larger number in small herds scattered through the Great Basin country to the west. Furthermore, some fairly hopeful experiments are being conducted in getting them started in waste lands capable of supporting them.

Science News-Letter, June 28, 1930

Space as Sole Carrier of Reality

Physics

"SPACE will finally survive as the sole carrier of reality."

So Prof. Albert Einstein predicted to the Second World Power Conference in Berlin. To the audience of two thousand which assembled to hear his address, Prof. Einstein was introduced as "the Newton of the present day."

Prof. Einstein traced the evolution of man's ideas of the constitution of the universe from the days of the old Euclidean geometry which gave a notion of space based on the relations of bodies in connection with each other.

Descartes was the first to introduce space as the general container of the universe, Prof. Einstein declared. The picture of space as seen by Newton did suffice, he said, to describe physical relations until Maxwell introduced his field theory of electromagnetic waves upon which the whole of modern electrical development has been based.

The fact that electromagnetism acts at a distance made the conception and notion of an ether necessary. But, Prof. Einstein, destroyer of the necessity for an ether, explained:

"By means of the relativity theory space loses its generality and its structure must be regarded as changeable. There is analogously to Reimann's geometry a mathematical space structure possible wherein metric continuity and direction are united in a four-dimensional reality."

Space was originally derived from physical bodies. This space has annihilated the ether and time. Prof. Einstein is now engaged in the formulation of newly developed generalizations which promise to annihilate fields of force, corpuscle and material particles in such a way that the fundamental stuff of the universe will prove to be, not matter as previously supposed, but space itself.

Science News-Letter, June 28, 1930

Multiple Ailerons

Ornithology

WHEN men first began to dream of flying like birds (which they have done ever since the legendary Daedalus) they watched the flight of birds, hoping to catch their trick and learn to imitate them. The many-faceted Leonardo used to spend hours and days watching and sketching pigeons. And when at last the Wrights led the way into the air they avoided the tragic fate of Icarus and kept their balance on their unstable supporting medium because they had seen how birds use their flexible wing-tips in coördination with their tails to maintain themselves on an even keel or to turn and bank as they will. The flexing wing-tips of the early Wright models, succeeded by the little auxiliary hinged planes we call ailerons, are man's efforts to build himself wings that are really like those of the birds.

The coming of the great sport of gliding, as distinguished from aviation, is bringing new attention to details and refinements of maneuvering which the powerfully engined airplane can afford to overlook, or which at its higher speed it cannot adopt.

The most successful of gliding birds are the condors, and their relatives the vultures and buzzards. They hang aloft for hours, with scarcely a flap of their wings, even climbing to great heights by cleverly taking advantage of rising currents of air.

One thing notable about the silhouette of a condor or vulture as seen from underneath is the way he stretches out the long, stiff feathers of his wing-tip, like the fingers of a hand. Most other birds keep these balancing feathers close together. If you will watch the flight of a buzzard with a pair of field glasses, you will see that sometimes he makes a delicate adjustment of position by the shift of a single feather, or by a ripple-like sequential movement of the feathers one after the other. In effect, he has not one aileron but half-a-dozen or more on each wing-tip, separate yet coördinated. There may be something in this system worth the study of our growing group of glider enthusiasts.

The condor shown on the cover of this week's SCIENCE NEWS-LETTER is a mounted bird, that soars motionless in the artificial heavens of the great bird dome of the American Museum of Natural History in New York City.

Science News-Letter, June 28, 1930

Now Ready:

How to Write

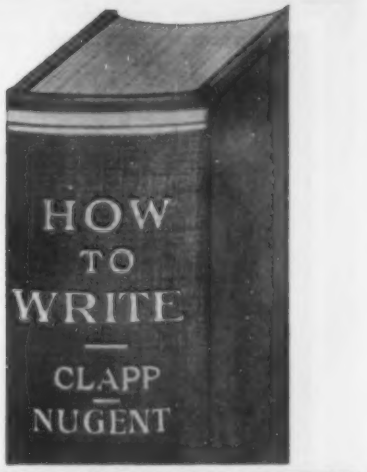
Meeting the Needs of Everyday Life

by John Mantle Clapp

Lecturer on Speech, New York University; formerly Professor of English, Illinois College, Indiana University, Lake Forest College; co-author of "How to Talk"

and Homer Heath Nugent

Professor of Rhetoric, Rensselaer Polytechnic Institute; author of "A Book of Exposition"



AS AN ADULT, you do not think of writing as a matter of abstract schoolroom exercises. You think of it in terms of jobs to be done—of notes, memoranda, letters, reports, instructions or whatever other writing you must do in your business, social, and private affairs.

Heretofore, books on writing have been written either for immature students or for professional writers. They have dealt almost exclusively with form and arrangement, with the detail technique of writing. Now in this new book, "How to Write," you are offered specific methods to guide you in accomplishing the purpose you have in mind when you sit down to write, no matter what type of writing you wish to do.

This book is designed solely to meet the practical requirements of adults—of men and women who wish to develop their power of putting ideas into written form with less effort and with greater effectiveness. It simplifies the whole problem. It shows you exactly what points you must keep in mind in each type of writing that you do. It shows you exactly what steps you have to take to produce the desired effect on any reader.

ALTHOUGH no book has ever before been written from this viewpoint, the methods explained are by no means experimental. They have been developed by the authors over a long period of years and proved sound in working with hundreds of adult students who wished to master the art of effective writing. In many cases the ideas now brought together in this new book have effected almost phenomenal improvement within a remarkably short time.

All the material you'll need for practice you'll find in the writing you have to do everyday. "How to Write" shows you how to make use of this material to develop the expert skill you desire—without having to go elsewhere for artificial exercises. It gives you just the kind of help you've always longed for but could never find.

NEVER before within the covers of one book has been assembled so much information on simple and practical methods, that can be applied to meet the needs that every man faces. It is manifestly impossible within limited space to outline more than partially a work of this great scope. In the condensed outline below, therefore, we have been forced to omit scores of important topics with which "How to Write" deals. You need personally to examine a copy of the book itself to see how much assistance it offers you on the specific points that bother you.

Special Examination Offer

Will you let us send you a copy of "How to Write," delivery charges prepaid and without advance payment, so that you can form your own opinion about the value of this new book?

Fill in and mail the coupon—the book will be sent you at once on this approval basis. If you do not feel that its purchase will prove one of the best investments you ever made, just return it to us and that ends the matter. Otherwise remit $5.00 in full payment.

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Getting the Right Viewpoint

The Problem You Face. Points that you must consider in making an accurate record of your thought. Communicating your thought effectively to another mind.

How to Study This Subject. In studying writing you are studying an action—not isolated rules for words or sentences but how to build ideas together. The key to success is analysis of the situation, the relation between yourself and the reader in each special instance.

The Problem of Accurate Statement

Studying the Art of Writing. The place to begin. How to put your own records, memoranda, and plans in a form that you can safely depend on for future use.

Discovering What's in Your Mind. Examining what is involved in the act of crystallizing your thought on a given matter. Finding practical ways of improving your methods.

Recording Your Thought. Short-cut methods for checking the accuracy of your thought.

Writing to Friends

The Problem of Reaching Other Minds. Ways of making yourself remember that your reader's mind works differently from your own. How to allow for differences; how to take advantage of similarities.

Personal Letters—Their Nature and Purpose. Your personal letters can teach you methods of making any writing interesting. How to say what needs to be said without giving offense.

Arranging Ideas for Suggestion. How to apply the psychology of suggestion in the effective arrangement of your ideas. Using the ideas you gain in writing personal letters to express your ideas with urbanity and tact in all your writing.

Writing in Business and Professional Life

Business Writing—Its Nature and Scope. Effective methods for handling the most universal and important of all kinds of writing.

Reports. How to make sure that your reports adequately meet their purpose.

Instruction. How to prepare instructions that will be understood and followed. Dangers to guard against. Instructions to workmen; to executives.

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Letter Problems of the Small Firm and the Individual. How the small firm and the private individual can apply to their own needs the letter technique developed by the huge corporation.

Addressing the Public

Addressing a Circle of Readers. How to make your message complete so that it will hold the interest of any mind.

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Writing a Long Paper. Special points to consider when you have extended writing to do. How to sustain attention; how to focus interest on points of chief importance.

Writing to Get Action. How to apply to your own special needs, the technique of persuasion writing developed by professional advertising writers.

Writing for Your Own Pleasure

Self-Expression—The Pleasure of Working Out a Literary Form. The amusement you can get from turning the skill developed in practical writing to your own entertainment and that of others.

Some Prose Patterns—Effective writing of diaries, reminiscences, accounts of travels, epigrams, informal essays.

Stories. How to tell a story well. Relating a personal experience in entertaining narrative form. Humorous stories.

Verse Patterns. Types of verse we all can write. Mechanics of verse form limericks, ballads, and other forms.

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